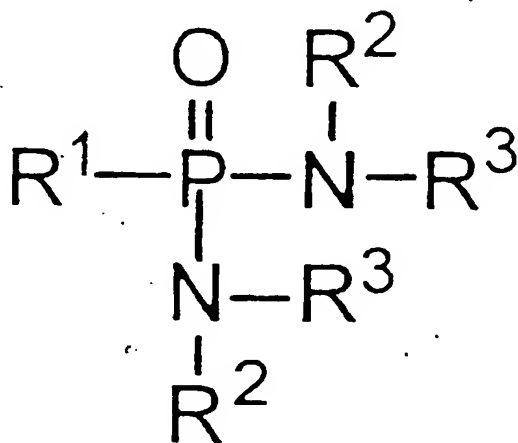


## ABSTRACT

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The invention provides a process by which rare earth metal ions can be efficiently extracted by easy operation, and effective extracting reagents for the process. Specifically, phosphonamides represented by the general formula [1]; a process for producing the same; reagents for extracting rare earth metal ions, containing the phosphonamides; and a process for extraction of rare earth metal ions with the phosphonamides: [1] wherein  $R^1$  is alkyl, cycloalkyl, alkenyl, cycloalkenyl, alkynyl, aryl, aralkyl, or a heterocyclic group, with the proviso that each group may be substituted;  $R^2$  is hydrogen, alkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, aralkyl, or a heterocyclic group, with the proviso that each group may be substituted;  $R^3$  is hydrogen, alkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, aralkyl, or a heterocyclic group, with the proviso that each group may be substituted, or the two  $R^3$ s may be united to form alkylene, cycloalkylene, or arylene.



[ 1 ]